

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



In Application of:

Trung T. Doan

Serial No.: 09/652,969

Filed: August 31, 2000

For: CHEMICAL DISPENSING SYSTEM
FOR SEMICONDUCTOR WAFER
PROCESSING

§ Group Art Unit: 1763

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§ Examiner: Sylvia R. MacArthur

§ Atty. Docket: 93-0421.05

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APPLICANT'S BRIEF ON APPEAL

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Appendix 1: Copy of Involved Claims

Appendix 2: *United States Surgical Corp. v. Ethicon Inc.*, 103 F.3d 1554, 41 U.S.P.Q.2d 1225 (Fed. Cir. 1997), *cert. denied*, 522 U.S. 950 (1997).

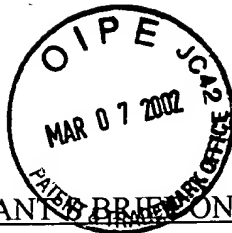
Appendix 3: *In re Young*, 927 F.2d 588, 18 U.S.P.Q.2d 1089 (Fed. Cir. 1991).

Appendix 4: *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 227 U.S.P.Q. 543 (Fed. Cir. 1985).

Appendix 5: *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 U.S.P.Q. 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984).

Appendix 6: *In re Keller*, 642 F.2d 413, 208 U.S.P.Q. 871 (C.C.P.A. 1981).

Appendix 7: *In re Merck & Co.*, 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986).



APPLICANT'S BRIEF ON APPEAL

I. REAL PARTY IN INTEREST

The Applicant, Trung Doan, has assigned his interest in this application to Micron Technology, Inc.

II. RELATED APPEALS AND INTERFERENCES

On February 19, 2002, Applicant filed a Notice of Appeal as part of the prosecution of application serial no. 09/133,989, which was filed August 14, 1998. Application '989 is the parent application to the current application under appeal. As of the time of submitting this Appeal Brief, Applicant has not yet filed an Appeal Brief in '989.

On January 15, 2002, Applicant filed a Notice of Appeal as part of the prosecution of application serial no. 09/652,713, filed August 31, 2000. Application '713 is a divisional of '989 and therefore a sibling of the current application under appeal. As of the time of submitting this Appeal Brief, Applicant has not yet filed an Appeal Brief in '713.

III. STATUS OF THE CLAIMS

Claims 1-40 have been presented during prosecution of the application under appeal.

Claims 1-37 have been canceled.

Claims 38-40 are pending.

Claims 38-40 are rejected under 35 U.S.C. §103 as being obvious in light of Iwata (U.S. Patent No. 4,611,553) in combination with Milina (U.S. Patent No. 5,444,921).

Claims 38-40 are appealed.

IV. STATUS OF THE AMENDMENTS

Applicant filed no amendments subsequent to final rejection.

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V. SUMMARY OF THE INVENTION

The current invention addresses a removal system for a workpiece having an overlying material. The system comprises a nozzle having an extended position and a retracted position. (Specification at p. 4, ln. 7-8.) While in the extended position, the nozzle is disposed toward the workpiece (*Id.*; FIGS. 1&2) and configured to dispense a chemical toward the workpiece (*id.* at p. 3, ln. 17-18; p. 4, ln. 2-3, 15-16; FIGS. 1&2). The system also comprises a suction applicator commensurately movable with the nozzle (*id.* at p. 4, ln. 7-8) and defining a port around the nozzle (*id.* at p. 3, ln. 18-19; p. 4, ln. 5-11, 17-18; FIGS. 1&2). The suction applicator is configured to withdraw the chemical and the material at a distance from the workpiece. (*Id.* at p. 4, ln. 3-11, 16-18; FIGS. 1&2.) In a more specific exemplary embodiment, the nozzle is further configured to dispense the chemical toward the material. (*Id.* at p. 4, ln. 2-3, 15-16; FIGS. 1&2.) In another more specific exemplary embodiment, the nozzle is further configured to dispense the chemical toward a portion of the workpiece interposed between the nozzle the said material. (*Id.*)

VI. ISSUE

There is one issue for determination on appeal: whether the Examiner has failed to satisfy the burden for rejecting the claims as being obvious in light of Iwata combined with Milina.

VII. GROUPING

Applicant defines the following group of claims for consideration upon this appeal. This group corresponds to the issue listed above.

Group 1: claims 38-40.

VIII. ARGUMENT: the Examiner has failed to satisfy the burden for rejecting the claims as being obvious in light of Iwata combined with Milina.

In rejecting claims 38-40 as being obvious in light of Iwata combined with Milina, the Examiner suggested that Iwata discloses all of the limitations except those concerning a nozzle's extended and retracted positions. The Examiner then argued that one of ordinary skill in the art would be motivated to apply Milina's teachings to modify Iwata's device. The Examiner concluded that such a modification renders the claims obvious. Applicant contends that there are flaws in the Examiner's argument that result in a failure to meet the burden for rejecting the claims. Specifically, the Examiner has misinterpreted the disclosure in Iwata, and the Examiner has erred in attempting to combine Iwata and Milina.

A. The Examiner has misinterpreted Iwata.

The Examiner's main argument in favor of rejection merely briefly described Iwata's device using terms found in Iwata's disclosure. (Office Action dated 9/26/01 at 2 (summing up Iwata in only 4 lines of text).) The Examiner concluded the analysis of Iwata by announcing that it fails to disclose claim 38's limitations concerning a nozzle's extended and retracted positions. (*Id.*) Hence, the implication is that the Examiner believes Iwata to disclose all of the limitations except the ones specified. However, in addition to requiring an extended position and a retracted position for a nozzle, claim 38 further requires that the nozzle be *disposed toward a workpiece*. Dependent claim 39 incorporates this limitation and further requires that the nozzle be configured to dispense a chemical *toward a material overlying the workpiece*. Dependent claim 40 incorporates claim 38's limitations and further requires that the nozzle be configured to dispense the chemical *toward a portion of the workpiece*. Applicant contends that Iwata not only fails to disclose these limitations but also actively teaches away from them.

Specifically, rather than Iwata disposing its arguably analogous jetting outlet toward its web, Iwata emphasizes offsetting its jetting outlet so that it is disposed toward the interior of Iwata's suction nozzle. Iwata first teaches this in its Abstract, then goes on to highlight this feature when summarizing the invention (Iwata at col. 1, ln. 66-col. 2, ln. 2). Iwata further touts this configuration as part of the preferred embodiment. (*Id.* at col. 2, ln. 25-27.) In addition, the

feature is in every one of Iwata's claims (*id.* at col. 3-4 (expressing the offset limitation in claim 1 and incorporating that limitation in dependent claims 2-5)) and is clearly depicted in at least half of Iwata's figures (*id.* at fig. 1 and fig. 3). Significantly, Iwata twice describes this configuration as "essential" and further indicates that its purpose is to "form an eddy stream at the end of the nozzle." (*Id.* at col. 2, ln. 44-63.) Thus, rather than configuring the jetting outlet to dispense cleaning liquids toward the edge bead or the web, Iwata teaches configuring the jetting outlet to dispense cleaning liquid away from those elements and toward the suction nozzle. Hence, Iwata teaches in the strongest terms only the exact opposite of the limitations of claims 38-40 specified above. As a result, Iwata cannot be interpreted as disclosing all limitations except for those concerning a nozzle's extended and retracted positions. Rather, Iwata should be interpreted as teaching away from the invention addressed in claims 38-40. An additional consequence of properly interpreting Iwata is a demonstration that the Examiner has misinterpreted that reference and therefore failed to meet the burden for rejection. Moreover, if Milina's disclosure somehow cures this defect in Iwata, the Examiner has failed to address how Milina does so, thereby further indicating the failure to meet the burden.

Applicant has raised this argument before. (Response submitted 7/10/01 at p. 2.) As a result, the Examiner supplemented the main arguments of the latest Office Action by asserting that Applicant's interpretation of Iwata would result in a device that is inoperative in dispensing fluid toward the workpiece. (Office Action dated 9/26/01 at p. 3) The Examiner then offered an alternative interpretation of Iwata, suggesting that Iwata's jetting outlet dispenses fluid toward the workpiece. (*See id.*) Applicant contends that Iwata's own disclosure refutes the Examiner's argument. Iwata's figure 1 and 3 clearly illustrate that the jetting outlets 5 and 5' are directed away from the web 2, away from the edge beads 3 and 3', and are instead directed to the interior of their respective suction nozzles 4 and 4'. In addition, as mentioned above, Iwata's text emphasizes that the offset jetting outlets are neither accidental nor incidental but rather an "essential" configuration because they "form an eddy stream at the end of the nozzle" (Iwata at col. 2, ln. 44-49.) Thus, Iwata's figures and references to an offset jetting outlet and to an eddy stream indicate that the jetting outlet is in fact disposed away from the web, away from the edge bead, and toward the interior of the suction nozzle; the interior of the suction nozzle then deflects the cleaning liquids toward the edge bead. Therefore, under Applicant's interpretation (or any reasonable interpretation given Iwata's plain language and illustrations) Iwata discloses embodiments that are in fact

operative in dispensing cleaning liquids toward a workpiece yet fail to disclose the relevant claim limitations. Moreover, support for the operability of Iwata's configuration can be found in Iwata's text itself, which states that the offset jetting outlet and resulting eddy stream "effectively and positively" clean the sucking inlets 6 and 6'. (Iwata at col. 2, ln. 44-63.)

Iwata subsequently goes into further detail about the benefits of this configuration, which has bearing on the Examiner's interpretation of Iwata:

no dead zone is provided in the suction nozzle. Therefore, the coating composition will not solidify or accumulate inside the nozzle; that is, the nozzle is maintained clean at all times. Thus, the nozzle can operate stably for long periods. As a result, in the manufacture, for instance, of a recording material which includes coating and drying steps, the use of the suction nozzle can decrease the drying load and increase the productivity.

(*Id.* at col. 3, ln. 1-9.) Under the Examiner's interpretation of Iwata, the jetting outlet would be directed toward Iwata's web. However, this would risk providing a "dead zone" in Iwata's suction nozzle. In turn, that would result in the coating composition solidifying or accumulating inside the nozzle. As a result, the nozzle would not remain clean and would therefore fail to operate stably for long periods. Ultimately, the drying load would increase and the productivity would decrease. Thus, Iwata suggests that it is the Examiner's interpretation that would result in an apparatus that is inoperative in dispensing fluid to the workpiece. This error in the Examiner's interpretation provides yet another indication that the burden for rejection has not been met.

Alternatively, if the Examiner is correct that dispensing fluid only toward the interior of Iwata's suction nozzle results in an inoperable device, then the problem is with Iwata's disclosure, not with Applicant's interpretation, as demonstrated by the Iwata citations provided above. The result of this alternative is that the Examiner has established Iwata to be an unreliable source of teaching to one of ordinary skill in the art. Given Iwata's lack of direction to the artisan, Iwata would be an unusable basis for an obviousness rejection, once again demonstrating the Examiner's failure to meet the burden for this rejection.

B. The Examiner has erred in attempting to combine Iwata and Milina

Assuming *arguendo* that Iwata could serve as a reliable source of teaching for some combination in an obviousness rejection, Applicant contends the Iwata/Milina combination proposed by the Examiner is untenable. An obviousness rejection requires that the multiple prior art references suggest to one of ordinary skill in the art to combine the references. (See *United States Surgical Corp. v. Ethicon Inc.*, 103 F.3d 1554, 1564, 41 U.S.P.Q.2d 1225, 1233 (Fed. Cir. 1997), *cert. denied*, 522 U.S. 950 (1997).) Further, when the prior art contains conflicting references, the ability of each reference to suggest solutions to one of ordinary skill in the art must be considered. (See *In re Young*, 927 F.2d 588, 18 U.S.P.Q.2d 1089, 1091 (Fed. Cir. 1991).) (Copies of these cases are included in an appendix to this Appeal Brief.) Applicant contends that such consideration reveals that Iwata and Milina conflict with each other so greatly that they are unable to suggest solutions that cover the limitations in the appealed claims to one of ordinary skill in the art.

The conflicts between the references begin at the broadest concepts touted by them. Iwata concerns a device for treating a particular type of workpiece (Iwata at Abstract), whereas Milina is not concerned with the actual treatment but rather the *preparation* for treating a workpiece (see Milina at Abstract). Moreover, the disparate types of workpieces and treatment circumstances demonstrate still other conflicts between the references that would discourage their combination. Milina's workpiece is a generally circular semiconductor wafer (see Milina at col. 1, ln. 15-16; col. 4, ln. 10-11; FIG. 1), whereas Iwata's workpiece is an elongated flexible web (Iwata at Abstract; col. 1, ln. 6-7). The differences in workpiece types, in turn, lead to different methods of supporting them. Milina proposes supporting its wafer on a circular chuck and holding the wafer thereon using a vacuum, or negative pressure. (Milina at col. 1, ln. 14-25; col. 4, ln. 3-15; FIG.1.) Iwata is not clear about how its web is supported, although Iwata does mention rollers under the web. (Iwata at col. 1, ln. 49-53.) Nevertheless, the elongated nature of Iwata's workpiece suggests that a support such as the one used in Milina is inefficient at best should one of ordinary skill in the art attempt to apply Milina's support technique to Iwata's workpiece. Further, the flexibility of Iwata's workpiece suggests that Milina's vacuum chuck technique may undesirably alter the workpiece's shape. This would be especially true if the negative pressure touted by Milina were to be applied to a pressure sensitive substrate touted by Iwata. (Iwata at col. 1, ln. 12.)

The differences in supporting the workpieces are also determined in part by the differences in handling the workpieces, which in turn illustrate other conflicts between the references. Milina, for instance, rotates its circular wafer around its center (*see* Milina at col. 4, ln. 11-16; FIG. 1), whereas Iwata moves its web in a linear direction (*see* Iwata at col. 2, ln. 19-21). Applicant asserts that Iwata's elongated flexible web does not easily lend itself to Milina's rotation technique, nor does Iwata's linear motion technique take advantage of centrifugal force that would be useful in distributing material on Milina's circular wafer. Given such conflicts between workpiece handling techniques, one of ordinary skill in the art would be once again discouraged from attempting to combine the references' teachings.

Workpiece processing highlights yet another point of contention between the references. When Milina dispenses removal fluid at its circular wafer's periphery, only a single nozzle is needed to accommodate the rotating periphery. (Milina at FIG. 4.) On the other hand, when Iwata dispenses cleaning liquid to the web's periphery, at least two jetting outlets are needed -- one for each side of the linearly moving elongated web. (Iwata at FIGS. 1&3.) Thus, applying Milina's single nozzle in Iwata's linearly-moving web would result in insufficient edge bead removal, whereas applying Iwata's dual jetting outlets to the periphery of Milina's spinning wafer would result in unnecessary redundancy.

The disposition of the nozzles themselves offer still another example of the conflict between the references. Milina teaches that prior art devices provide a nozzle disposed toward the wafer. (Milina at col. 1, ln. 26-37; col. 4, ln. 17-27; FIG. 1.) Further, Milina continues this tradition in its preferred embodiment. (*Id.* at col. 5, ln. 13; FIG. 4) As discussed in part (A) above, however, Iwata actively teaches against disposing its jetting outlets in such a manner in order to avoid rendering the device inoperable. Conversely, Milina suggests to one of ordinary skill in the art that the configuration of Iwata's jetting outlet disposition adds unnecessary complexity.

The dispensing location taught by the references provides yet another instance of conflict. In both the prior art and preferred embodiments of the invention, Milina encourages dispensing removal fluid on the backside of the wafer (Milina at col. 1, ln. 58-62; col. 5, ln. 13; FIGS. 1&4) while Iwata expressly teaches against this, warning that exposing the rear of its web to the cleaning liquid risks fouling the support surface and in general causing the artisan to suffer difficulties. (Iwata at col. 1, ln. 49-53.)

Device-to-workpiece spacing is still another point of contention between the references. Iwata is relatively cavalier in its spacing requirements, teaching that any distance ranging from 0.5 to 2 mm is sufficient to remove an edge bead. (Iwata at col. 2, ln. 64-68.) In contrast, Milina's entire specification, and accordingly Milina's invention itself, emphasizes the need for precise spacing between the nozzle and the wafer.

On the other hand, Iwata's entire specification, and accordingly Iwata's invention itself, emphasizes the need for vacuuming the cleaning liquid. This is in contrast to Milina, which addresses dispensing and is aware of suction technology (having used a vacuum chuck to hold the workpiece) yet chooses to avoid the time, money, effort, and complication of machinery involved with sucking the dispensed liquid. Instead, Milina is content to allow the liquid to collect in a drain cup. (Milina at col. 4, ln. 28-30; FIG. 1.) Thus, Milina's implicit rejection of Iwata's technology provides further discouragement to their combination.

Returning to the broad concepts touted by the references, the points of contention discussed above indicate that one of ordinary skill in the art would find that Milina's teachings concerning rotating a gap gauge on a vacuum chuck have no application to Iwata, as there is no chuck in Iwata, nor is there any other suitable element on which to rotate such a gauge, nor is Iwata concerned about the relevant gap. Further, the artisan would find that Iwata's dual dispensing/cleaning devices have no application to Milina, as Milina's device defines only one continuous periphery, and there is apparently no need to vacuum the material dispensed in Milina's device.

Therefore, the conflicts between the references at every level of consideration – from the general premises to the specific processes – indicate that one of ordinary skill in the art would lack motivation to combine the teachings; in fact, such conflict would motivate the artisan to avoid any attempts at combination.

Applicant pointed out at least some of these conflicts to the Examiner in a previously-submitted Response. (Response submitted 7/10/01 at p. 2-3.) The Examiner replied by accusing Applicant of piecemeal analysis. (Office Action dated 9/26/01 at p. 3.) Applicant contends that the analysis in this Appeal Brief and the previously-submitted Response is more accurately characterized as considering the references as a whole, which is the standard set forth by case precedent:

[w]hen prior art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself. There must be "something in the prior art *as a whole* to suggest the desirability, and thus the obviousness, of making the combination". . . . Not only must the claimed invention as a whole be evaluated, but so also must the references *as a whole*

....

(*Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 227 U.S.P.Q. 543, 551 (Fed. Cir. 1985) (citations omitted) (emphasis added). See also *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 U.S.P.Q. 303, 308, 311 (Fed. Cir. 1983) (requiring that section 103 references be assessed in their entirety), *cert. denied*, 469 U.S. 851 (1984). These cases are provided in an appendix to this Appeal Brief.) In addressing the wide-ranging points of disclosure of both references, from their broad concepts to their specific embodiments, Applicant has satisfied the standards set forth by case precedent.

Unfortunately, by admitting that Milina was cited only for a select portion of its disclosure (Office Action dated 9/26/01 at p. 3), the Examiner has indicated a failure to consider Milina as a whole, thereby providing yet another indication to the Board of the Examiner's failure to meet the burden for rejection. Further, Applicant contends that the only way the Examiner was able to sift through the legion of Iwata's and Milina's directly opposing teachings and choose the particular portions that ostensibly cover the claimed invention is with the benefit of hindsight gleaned from the current application. Such conduct is once again contrary to the standards of *Interconnect* and *Gore* and further emphasizes the Examiner's failure to meet the burden for rejection.

The Examiner also responded to Applicant's previous arguments by accusing Applicant of having attacked the references individually and concluding that such arguments cannot refute an obviousness rejection. As authority, the Examiner cited *In re Keller*, 642 F.2d 413, 208 U.S.P.Q. 871 (C.C.P.A. 1981) and *In re Merck & Co.*, 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Significantly, those cases addressed an applicant's attempt to distinguish the claimed invention from only one of a combination of references. (*Keller*, 208 U.S.P.Q. at 882 (refuting an attempt to distinguish from only the Walsh reference); *Merck*, 231 U.S.P.Q. at 380 (refuting an attempt to distinguish from only the Petersen reference).) This proposition is not relevant to Applicant's argument, as Applicant is not attacking individual references as they apply to his

invention. Rather, Applicant is attacking the Examiner's decision to combine the references by analyzing how Iwata and Milina apply to each other, without involving the appealed claims. Thus, while the Examiner's statement of the law may be correct, that law has no bearing on the current facts. Rather, the standard posed in *Interconnect* and *Gore* is the relevant rule, and Applicant requests that the Board consider the impropriety of the Iwata/Milina combination in light of that standard.

C. Conclusion

A careful analysis of Iwata's disclosure demonstrates that the reference fails to disclose claim limitations in addition to what the Examiner admits. Thus, the Examiner's misinterpretation of Iwata and the Examiner's failure to indicate whether or how Milina might cure Iwata's lack of disclosure demonstrate a failure to satisfy the burden for rejecting the appealed claims as being obvious in light of an Iwata/Milina combination. In addition, considering Iwata and Milina as a whole demonstrates that there is no motivation for one of ordinary skill in the art to combine those references. Further, the Examiner's failure to conduct such an analysis provides additional indication to the Board that the Examiner has failed to satisfy the burden for rejecting the appealed claims. Moreover, because the references are rife with contradictions at any level of analysis, the artisan is actively motivated to avoid their combination. As a result, Applicant respectfully requests that the Board withdraw the rejections and allow the claims.

Respectfully submitted,



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Appendix 1: Copy of Involved Claims

38. A removal system for a workpiece having an overlying material, comprising:

a nozzle having an extended position and a retracted position, wherein said nozzle is disposed toward said workpiece and configured to dispense a chemical toward said workpiece while in said extended position; and

a suction applicator commensurately movable with said nozzle and defining a port around said nozzle, wherein said suction applicator is configured to withdraw said chemical and said material at a distance from said workpiece.

39. The removal system in claim 38, wherein said nozzle is further configured to dispense said chemical toward said material.

40. The removal system in claim 38, wherein said nozzle is further configured to dispense said chemical toward a portion of said workpiece interposed between said nozzle and said material.